CLAIMS

1. A method of treating hepatitis C virus (HCV)-containing samples which method comprises treating HCV-containing samples with a treating agent containing:

(1) an acidifying agent,

(2) a protein-denaturing agent, or an amphoteric surfactant or a cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule, to effect the release of the HCV antigen and the inactivation of antibodies that bind to the HCV antigen.

2. A method of treating HCV-containing samples which method comprises treating HCV-containing samples with a treating agent containing:

(1) an acidifying agent,

(2) an amphoteric surfactant or a cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule, and

either of the following (3), (4) and (5):

(3) a protein-denaturing agent, a nonionic surfactant or a reducing agent,

(4) a monosaccharide or a disaccharide, and

(5) citric acid or a citric acid salt,

to effect the release of HCV-related antigen and the inactivation of antibodies against HCV-related antigen.

3. A method of treating HCV-containing samples which method comprises treating HCV-containing samples with a treating agent containing at least one substance of the following (1) and (2) and at least one substance of the following (3) to effect the release of the HCV antigen and the inactivation of antibodies that bind to the HCV antigen:

(1) an acidifying agent,

(2) a protein-denaturing agent, and

(3) a nonionic surfactant or a reducing agent.

4. An method of detecting immunologically the HCV antigen comprising the steps of:

(1) treating according to any one of claims 1 to 3, and

(2) detecting the HCV antigen using a probe that binds to the HCV antigen.

5. A method according to any one of claims 1 to 3 in which said acidifying agent is hydrochloric acid, sulfuric acid, acetic acid, trichloroacetic acid, trifluoroacetic acid, or citric acid.

6. A method according to any one of claims 1 and 2 in which said amphoteric surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule is N-dodecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate, N-tetradecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate, N-hexadecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate and N-octadecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate.

7. A method according to any one of claims 1 and 2 in which said cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule is decyltrimethylammonium chloride, dodecyltrimethylammonium chloride, tetradecyltrimethylammonium chloride, hexadecyltrimethylammonium chloride, decyltrimethylammonium bromide, dodecyltrimethylammonium bromide, tetradecyltrimethylammonium bromide, hexadecyltrimethylammonium bromide, lauryl pyridinium chloride, tetradecyl pyridinium chloride and cetyl pyridinium chloride.

8. A method according to any one of claims 1 to 3 in which said protein-denaturing agent is urea or thiourea.

9. A method according to any one of claims 2 and 3

in which said nonionic surfactant is polyoxyethylene isooctylphenyl ethers such as Triton X-100 and Triton X-114, polyoxyethylene nonylphenyl ethers such as NP40 and polyoxyethylene sorbitane alkylesters such as Tween 80.

10. A method according to any one of claims 2 and 3 in which said reducing agent is cysteine, cysteamine, dimethylaminoethanethiol, diethylaminoethanethiol or diisopropylaminoethanethiol.

11. A method according to claim 2 in which said monosaccharide or disaccharide is maltose, sucrose, trehalose, mannose, fructose, glucose, sorbitol, galactose and dextrose.

12. A method according to claim 2 in which said citric acid or citric acid salt is citric acid, citric acid hydrate, sodium citrate and potassium citrate.

13. A diagnostic reagent or a diagnostic kit containing at least one substance of the following (1) and (2) in a treating agent for treating samples in order to detect the HCV antigen:

(1) an acidifying agent, and

(2) a protein-denaturing agent, or an amphoteric surfactant or a cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule.

14. A diagnostic reagent or a diagnostic kit containing at least one substance of the following (1) and (2) and at least one substance of the following (3) in a treating agent for treating samples in order to detect the HCV antigen:

(1) an acidifying agent,

(2) an amphoteric surfactant or a cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule, and

(3) a protein-denaturing agent, a nonionic surfactant or a reducing agent.

15. A diagnostic reagent or a diagnostic kit containing at least one substance of each of the following (1) and (2) and at least one substance of the following (3) in a treating agent for treating samples in order to detect the HCV antigen:

(1) an acidifying agent,

(2) a protein-denaturing agent, and

(3) a nonionic surfactant or a reducing agent.

16. A diagnostic reagent or a diagnostic kit according to any of claims 13 to 15 in which said acidifying agent is hydrochloric acid, sulfuric acid, acetic acid, trichloroacetic acid, trifluoroacetic acid, or citric acid.

17. A diagnostic reagent or a diagnostic kit according to any of claims 13 and 14 in which said amphoteric surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule is N-dodecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate, N-tetradecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate, N-hexadecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate and N-octadecyl-N,N-dimethyl-3-ammonio-1-propanesulfonate.

18. A diagnostic reagent or a diagnostic kit according to any of claims 13 and 14 in which said cationic surfactant having both a straight chain alkyl group of 10 or more carbon atoms and a tertiary amine or a quaternary ammonium salt in the same molecule is decyltrimethylammonium chloride, dodecyltrimethylammonium chloride, tetradecyltrimethylammonium chloride, hexadecyltrimethylammonium chloride, decyltrimethylammonium bromide, dodecyltrimethylammonium bromide, tetradecyltrimethylammonium bromide, hexadecyltrimethylammonium bromide, lauryl pyridinium chloride, tetradecyl pyridinium chloride and cetyl pyridinium chloride.

19. A diagnostic reagent or a diagnostic kit according to any of claims 13 to 15 in which said

protein-denaturing agent is urea or thiourea.

20. A diagnostic reagent or a diagnostic kit according to any of claims 14 and 15 in which said nonionic surfactant is polyoxyethylene isooctylphenyl ethers such as Triton X-100 and Triton X-114, polyoxyethylene nonylphenyl ethers such as NP40 and polyoxyethylene sorbitane alkylesters such as Tween 80.

21. A diagnostic reagent or a diagnostic kit according to any one of claims 14 and 15 in which said reducing agent is cysteine, cysteamine, dimethylaminoethanethiol, diethylaminoethanethiol or diisopropylaminoethanethiol.

22. A hybridoma cell line that is HC11-9 (FERM BP-08493), HC11-21 (FERM BP-08494), or OT3 (FERM BP-10032).

23. A monoclonal antibody produced by a hybridoma that is HC11-9 (FERM BP-08493), HC11-21 (FERM BP-08494), or OT3 (FERM BP-10032).